IRTEC
INNOVATIVE RECLAMATION TECHNOLOGIES & ENGINEERING CO., INC.
211 MAIN STREET, P.O. BOX 306, CARYVILLE, TENNESSEE 37714
TELEPHONE: (423)-566-1915
FAX: (423)-566-1966

September 12, 2014

Mr. Jonathon Burr, NPDES Program Manager
Mining Section
Division of Water Resources
Tennessee Department of Environment and Conservation
3711 Middlebrook Pike
Knoxville, TN 37921-6538

Subject: Affordable Development Park, LLC; Caryville Limestone
Aquatic Resource Alteration Permit Application
NPDES Permit TN0079782
Campbell County

Dear Mr. Burr:

Attached please find a completed aquatic resource alteration permit (ARAP) application for the subject operation. This site was previously issued an ARAP for the same project but it expired prior to commencement of the operation. We have been in discussion with Mr. Dan Murray of your staff concerning this project.

Enclosed with this submittal is a completed application along with a check for the processing fee. A set of plans are going to be emailed to Mr. Murray this afternoon.

Should you have any immediate questions or request additional information, please contact me at the address or phone number above.

Sincerely,

Tim K. Slone, PE, PLS
On Behalf of Affordable Development Park

Enclosures

cc: Bobby Adkins, Affordable Development Park, LLC
File

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Water Resources
William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
1-888-891-8332 (TDEC)

Application for Aquatic Resource Alteration Permit (ARAP) & State §401 Water Quality Permit

OFFICIAL STATE USE ONLY	Site #:		Permit #:	

Section 1. Applicant Information *(individual responsible for site, signs certification below)*

Applicant Name: Bobby Adkins				
Company: Affordable Development Park, LLC		Signatory's Title or Position: Managing Member		
Mailing Address: P O Box 910		City: Caryville	State: TN	Zip: 37714
Phone: 423-562-4628	Fax: 423-566-4080	E-mail: adkinsdemolition@bellsouth.net		

Section 2. Alternate Contact/Consultant Information (*a consultant is not required*)

Alternate Contact Name: Tim K. Slone, PE, PLS				
Company: IRTEC, Inc.		Title or Position: President/CEO		
Mailing Address: P O Box 306		City: Caryville	State: TN	Zip: 37714
Phone: 423-566-1915	Fax: 423-566-1966	E-mail: irtec@comcast.net		

Section 3. Fee *(check appropriate box and submit requisite fee with application)*

☐ No Fee Submitted ☒ Fee Submitted with Application Amount Submitted: $ 500

Current fee schedules for Aquatic Resource Alteration Permit processing may be found at the Division of Water Resources webpage at http://www.tn.gov/environment/permits/arap.shtml or by calling (615) 532-0625. Make checks payable to "Treasurer, State of Tennessee".

Section 4. Project Details *(fill in information and check appropriate boxes)*

Site or Project Name: Caryville Limestone	Nearest City, Town or Major Landmark: Vasper	
Street Address or Location: US Hwy 25W at Heavens View Lane		
County(ies): Campbell	MS4 Jurisdiction: N/A	Latitude (dd.dddd): 36.2647
		Longitude (dd.dddd): 85.5017

Resource Proposed for Alteration: ☒ Stream ☐ Wetland ☐ Reservoir

Name of Water Resource: Unnamed Tributary to Right Fork of Coal Creek

Brief Project Description (a more detailed description is required under Section 8):

Minor Road Crossing

Does the proposed activity require approval from the U.S. Army Corps of Engineers, the Tennessee Valley Authority, or any other federal, state, or local government agency? ☐ Yes ☒ No

If Yes, provide the permit reference numbers: _____

Is the proposed activity associated with a larger common plan of development? ☒ Yes ☐ No

If Yes, submit site plans and identify the location and overall scope of the common plan of development. Plans attached? ☐ Yes ☒ No

If applicable, indicate any other federal, state, or local permit authorizations that the overall project site (common plan of development) has obtained in the past (i.e. construction general permit coverage and/or other ARAPs):

Limestone quarry and processing facility, NPDES Permit No. TN0079782

Section 5. Project Schedule *(fill in information and check appropriate boxes)*

Start date: September 2014	Estimated end date: October 2014

Is any portion of the activity complete now? ☐ Yes ☒ No If yes, describe the extent of the completed portion:

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The required information in Sections 6-11 must be submitted on a separate sheet(s) and submitted in the same numbered format as presented below. If any question in not applicable, state the reason why it is not applicable.

Section 6. Project Description		**Attached**	
		Yes	**No**
6.1	A narrative description of the scope of the project	☒	☐
6.2	USGS topographic map indicating the exact location of the project (*can be a photographic copy*)	☒	☐
6.3	Photographs of the resource(s) proposed for alteration with location description (*photo locations should be noted on map*)	☒	☐
6.4	A narrative description of the **existing** stream and/or wetland characteristics including, but not limited to, dimensions (e.g., depth, length, average width), substrate and riparian vegetation	☒	☐
6.5	A narrative description of the **proposed** stream and/or wetland characteristics including, but not limited to, dimensions (e.g., depth, length, average width), substrate and riparian vegetation	☒	☐
6.6	In the case of wetlands, include a wetland delineation with delineation forms and site map denoting location of data points	☐	☒
6.7	A copy of all hydrologic or jurisdictional determination documents issued for water resources on the project site	☐	☒

Section 7. Project Rationale	**Attached**	
	Yes	**No**
Describe the need for the proposed activity, including, but not limited to, the purpose, alternatives considered, and what will be done to avoid or minimize impacts to streams or wetlands.	☒	☐

Section 8. Technical Information		**Attached**	
		Yes	**No**
8.1	Detailed plans, specifications, blueprints, or legible sketches of present site conditions and the proposed activity. Plans must be 8.5.x 11 inches. Additional larger plans may also be submitted to aid in application review. The detailed plans should be superimposed on existing and new conditions *(e.g., stream cross sections where road crossings are proposed)*	☒	☐
8.2	For both the proposed activity and compensatory mitigation, provide a discussion regarding the sequencing of events and construction methods	☒	☐
8.3	Depiction and narrative on the location and type of erosion prevention and sediment control (EPSC) measures for the proposed alterations	☒	☐

Section 9. Water Resources Degradation (degree of proposed impact) *Note that in most cases, activities that exceed the scope of the General Permit limitations are considered greater than de minimis degradation to water quality.*

My activity, as proposed:

a. ☒ Will not cause measurable degradation to water quality

b. ☐ Will only cause de minimis degradation to water quality

c. ☐ Will cause more than de minimis degradation to water quality (*Complete additional sections 9-11)*

d. ☐ Unsure/need more information

For information and guidance on the definition of de minimis and degradation, refer to the Antidegradation Statement in Chapter 0400-40-03-.06 of the Tennessee Water Quality Criteria Rule: https://www.tn.gov/sos/rules/0400/0400-40/0400-40-03.20131216.pdf. For more information on specifics on what General Permits can cover, refer to the Natural Resources Unit webpage at http://www.tn.gov/environment/permits/arap.shtml

If you checked "c." above in Section 9, complete the following 2 sections, 10-11.

Section 10. Detailed Alternative Analysis		**Attached**	
		Yes	**No**
10.1	Analyze all reasonable alternatives and describe the level of degradation caused by each of the feasible alternatives	☐	☒
10.2	Discuss the social and economic consequences of each alternative	☐	☒
10.3	Demonstrate that the degradation associated with the preferred alternative will not violate water quality criteria for uses designated in the receiving waters, and is necessary to accommodate important economic and social development in the area	☐	☒

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Section 11. Compensatory Mitigation		Attached Yes	Attached No
11.1	A detailed discussion of the proposed compensatory mitigation	☐	☒
11.2	Describe how the compensatory mitigation would result in no net loss of resource value	☐	☒
11.3	Provide a detailed monitoring plan for the compensatory mitigation site	☐	☒
11.4	Describe the long-term protection measures for the compensatory mitigation site *(e.g., deed restrictions, conservation easement)*	☐	☒

Certification and Signature

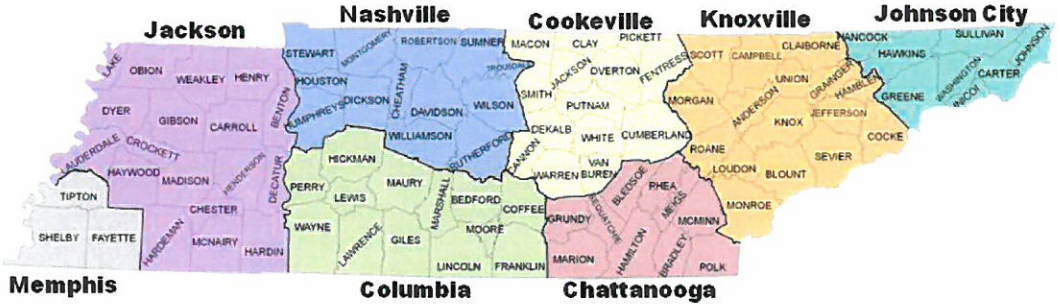
An application submitted by a corporation must be signed by a principal executive officer; from a partnership or proprietorship, by the partner or proprietor respectively; from a municipal, state, federal or other public agency or facility, the application must be signed by either a principal executive officer, ranking elected official, or other duly authorized employee.

"I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury".

Bobby Adkins	Managing Member		9-11-14
Printed Name	Official Title	Signature	Date

Submitting the form and obtaining more information Note that this form must be signed by the principal executive officer, partner or proprietor, or a ranking elected official in the case of a municipality; for details see **Certification and Signature** statement above. For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC). Submit the completed ARAP Application form (keep a copy for your records) to the appropriate EFO for the county(ies) where the ARAP activity is located, addressed to **Attention: ARAP Processing**. You may also electronically submit the complete application and all associated attachments (e.g., maps, wetland delineations and narrative portions) to water.permits@tn.gov.

EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305-4316	Chattanooga	540 McCallie Avenue STE 550	37402-2013
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601



OFFICIAL STATE USE ONLY

Received Date:	Permit Number:	Reviewer:	Field Office:
Fee amount paid:	T & E Aquatic Flora and Fauna:	Impaired Receiving Stream:	Application Review:
Date:			☐ Deficient Date:
Check #:	Exceptional TN Water:		☐ Complete Date:

PROJECT DESCRIPTION
(ARAP APPLICATION SECTION 6)

On behalf of Affordable Development Park, LLC, site owner, of Caryville, Tennessee, this aquatic resource alteration permit (ARAP) application is being prepared and submitted for a small project involving Coal Creek in Vasper, Campbell County, Tennessee.

The project consists of a minor road crossing (See Location Map provided in Appendix A). The project proposes to minimally alter the existing stream by installing a minor road crossing in approximately 200 feet of the stream channel.

The stream to be altered by this project is an unnamed tributary to Right Fork of Coal Creek. The source of the flow appears to be surface storm water runoff from rainfall events with some minor base flow from groundwater during wetter times of the year. No flow was observed at the road crossing site during recent site reconnaissance. Wetlands were not detected at the site. Photographs of existing conditions at the site are provided in Appendix B.

This minor road crossing is associated with a permitted quarry operation which previously had an approved ARAP (#NR07MS.005), dated December 17, 2007, which expired one year later. This application proposes to conduct the same type of alteration to provide access to the Caryville Limestone quarry, with the anticipated disturbance being 200 feet maximum. Based on existing topography and geographic features of the site, no feasible alternatives are available to the owner to reach the permitted quarry site.

The drainage area at the project site includes the local topography within a previously disturbed area and some upland drainage, with a watershed of approximately 97 acres at the road crossing site. The existing stream has evidence of sedimentation from previous disturbances and ranges from 15 to 20 feet in bankfull width, 1.6 to 3.2 feet of depth (at bank full) and 1.4 to 2.2 feet of bottom width. The water course was dry during the most recent site visit in the

vicinity of the proposed road crossing. The existing substrate consisted mainly of chert.

The stream is gentle sloping in the area of proposed alteration. Slopes are generally 4% or less. The majority of the reach of the project area has limited canopy with other anthropogenic disturbances dominating the immediate reaches of the water course.

PROJECT RATIONALE
(ARAP APPLICATION SECTION 7)

This minor road crossing provides access to a permitted quarry operation. The road crossing was previously approved but construction activities were not commenced due to economic conditions and the previous ARAP expired. That ARAP was under the previous general permit program that expired in 2010. This ARAP application is being submitted under the general permit program that doesn't expire until June 2015.

Based on existing topography and geographic features of the site, no feasible alternatives are available to the owner to reach the permitted quarry site.

Impacts to the water course will be minimized by implementing Best Management Practices (BMPs) during construction activities and complying with all of the terms and conditions of the General Permit for Construction and Removal of Minor Road Crossings.

TECHNICAL INFORMATION
(ARAP APPLICATION SECTION 8)

The proposed improvements consist of a minor road crossing along approximately 200 feet of water course reach. Construction details are provided in Appendix D.

The culvert size at the road crossing is based on topographic considerations and the small size of the watershed, being approximately 97 acres. The minimum conduit size is based on a 100YR-6HR storm event and resulted in a minimum size of 36". The accompanying SEDCAD run illustrates a Corrugated Metal Pipe; however, other materials may be used that exceed those minimum requirements, such as a reinforced concrete pipe (RCP) or a corrugated plastic pipe (CPP) with the same or larger conduit sizes.

Work will be performed in the dry by coordinating activities with the weather, preferably during the seasonally dry time of the year. This water course is usually dry at the road crossing site. If necessary, flow in the water course will be diverted through a temporary pipe within the stream channel or routed around the construction activities via a sandbag damn upstream of the construction activities and pumped around those activities. Best Management Practices (BMPs) are to be utilized to prevent and/or minimize the contribution of sediment to the receiving stream. BMPs may include, but are not limited to, temporary diversions, silt fences, straw bale dikes, berms, sumps, check dams, riprap, and prompt revegetation of disturbed areas. BMPs will be implemented in accordance with any existing permit requirements.

Erosion and sediment control measures shall be in place and functional before earth moving operations begin, and shall be constructed and maintained throughout the construction period. Information on erosion and sediment control measures can be found in the department's Erosion and Sediment Control Handbook (www.tn.gov/environment/wpc/sed_ero_controlhandbook/) Temporary

measures may be removed at the beginning of the work day, but shall be replaced at the end of the work day. Construction sequencing will consist of first clearing and grubbing the reach of the road crossing from the banks of the water course and recovering topsoil/subsoil from the flood plain areas for later use. Clearing, grubbing and other disturbances to the riparian vegetation shall be kept at a minimum necessary for slope construction and equipment operations. Unnecessary riparian vegetation removal, including trees, is prohibited. Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than 10 calendar days prior to grading or earth moving unless the area is seeded and/or mulched or other temporary cover is installed. Construction activities will stay out of the water course during these early stages. BMPs will be implemented to minimize impacts to the waters of the state. Stream beds shall not be used as transportation routes for construction equipment. Temporary stream crossings shall be limited to one point in the construction area and erosion control measures shall be utilized where stream banks are disturbed. The crossing shall be constructed so that stream flow is not obstructed. Following construction, if applicable, all materials used for temporary crossing shall be removed and disturbed stream banks shall be restored and stabilized if needed.

Installation of the conduit, or pipe, will be in such a manner that the bottom of the pipe should be constructed below the stream bed level in a manner that allows natural substrate to reestablish. Any activity may not be conducted in a manner that would permanently disrupt the movement of fish and aquatic life. The excavation and fill activities associated with the road crossing shall be kept to a minimum and shall be separated from flowing waters except in instances involving only the placement of a culvert or clean rock. The crossing shall be constructed in the dry to the extent practicable.

The width of the fill associated with the crossing shall be limited to the minimum necessary for the actual crossing. Only clean rock used for the road crossing may be placed directly in the stream. Clean rock shall not contain excessive fines, soils, or other wastes or contaminants.

Excavated materials, removed vegetation, construction debris, and other wastes shall be removed to an upland location and properly stabilized or disposed of in such a manner as to prevent reentry into the water course.

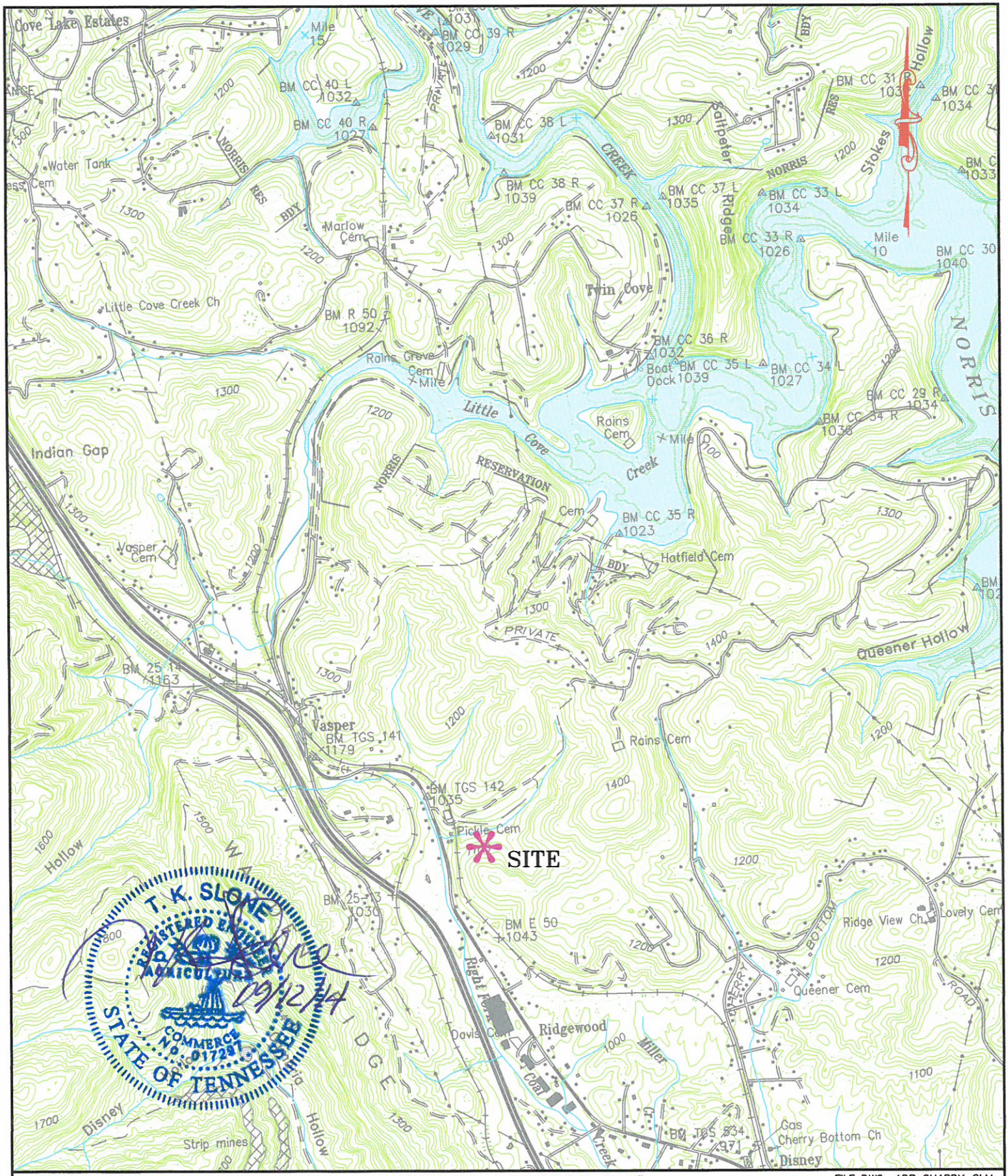
Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the state. All spills shall be reported to the appropriate emergency management agency and to the division. In the event of a spill, measures shall be taken immediately to prevent pollution of waters of the state, including groundwater. Litter, construction debris, and construction chemicals exposed to storm water shall be picked up prior to anticipated storm events or otherwise prevented from becoming a pollutant source for storm water discharges (e.g., screening outfalls, daily pick-up, etc.). After use, silt fences should be removed or otherwise prevented from becoming a pollutant source for storm water discharges.

Areas of disturbance will receive prompt revegetation or covered with a gravel base. Areas will be seeded and mulched in accordance with the revegetation plan contained with this ARAP application. Areas to receive prompt revegetation will include flood plains and out slopes not otherwise stabilized as soon as practicable after disturbance. Sod may be utilized for prompt cover.

Refer to the terms and conditions of the "General Permit for Construction and Removal of Minor Road Crossings" for methods, BMPs, and construction specifications (see Appendix C).

APPENDIX A

SITE LOCATION MAP



AFFORDABLE DEVELOPMENT PARK, LLC
P.O. BOX 910
CARYVILLE, TN 37714

GENERAL LOCATION MAP

SCALE: 1"=2000'
JACKSBORO QUAD.
(NAD 83)

PREPARED BY:
IRTEC
211 Main Street, P.O. Box 306
Caryville, TN 37714
423 566-1915

FILE DWG: ADP QUARRY_GLM
DATE: 06-04-12

LIMESTONE QUARRY
CAMPBELL COUNTY
JACKSBORO, TN
RIGHT FORK COAL CREEK
LAT: 36°15'53"
LONG: 84°11'06"

APPENDIX B

SITE PHOTOGRAPHS

PHOTO ID P-1 (REFER TO PLAN VIEW)

PHOTO ID P-2

PHOTO ID P-3

PHOTO ID P-4

APPENDIX C

GENERAL PERMIT FOR CONSTRUCTION AND REMOVAL OF MINOR ROAD CROSSINGS

Tennessee Department of Environment and Conservation
General Permit for
Construction and Removal of Minor Road Crossings

Effective Date: July 1, 2010
Expiration Date: June 30, 2015

Activities Covered by this Permit:
This general permit authorizes the construction and/or removal of minor road crossings. A "minor road crossing" is defined in Rule 1200-4-7-.03 as a bridged or culverted roadway fill across a stream or river which results in the alteration of 200 linear feet or less of stream bed (on a single stream) or shoreline. This permit also authorizes other transportation crossings of the same size restriction such as linear crossings of greenway trails.

Limitations of this Permit:
Certain activities due to size, location or potential water quality impacts are not covered under this general permit. Those activities are described in this section. Activities not qualifying for authorization under this general permit may be authorized by an individual permit, provided that all requirements of the *Tennessee Water Quality Control Act of 1977* are met.

1) Road crossings including transition channels, endwalls, aprons or rip rap that exceed a total length of 200 feet on a single stream for the entire project are not covered.
2) Road crossings that are anticipated to significantly alter the hydraulics of the stream (e.g., under-sizing or over widening the channel) are not covered.
3) Crossings that are non-linear features commonly associated with transportation projects such as vehicle maintenance or storage buildings, parking lots, cul-de-sacs and turn arounds are not covered.
4) Activities located in a component of the National Wild and Scenic River System, a State Scenic River, waters designated as Outstanding National Resource Waters are not covered.
5) Activities that may adversely affect wetlands are not covered.
6) Activities located in any waterway which is identified by the department as having contaminated sediments, and the activity will likely mobilize the contaminated sediments are not covered.
7) Activities that may result in an adverse effect to a threatened or endangered species, or to designated critical habitat; or is likely to jeopardize the continued existence of a species proposed for listing as endangered or threatened without prior authorization from the U.S. Fish and Wildlife Service as required by section 7 or section 10 of the Endangered Species Act where applicable are not covered. Adverse effects comprise, but are not necessarily limited to, the following: (a) death or injury to one or more individuals that results from activities associated with an action, (b) a change in habitat quantity or quality that results from activities associated with an action that renders the habitat unsuitable for the species, or (c) activities associated with an action that disrupts normal behavior or functions of individuals.
8) Activities that may result in the take, harassment, or destruction of plant or wildlife listed as threatened or endangered or a species deemed to be in need of management, as defined and identified under Tennessee Code Annotated (TCA) 70-08-103, Tennessee Wildlife Resources Agency (TWRA) Proclamations 00-14 and 00-15, and Division of Natural Heritage (DNH) Rule 0400-6-2 or which will destroy the habitat of such species without prior authorization from TWRA and/or DNH where applicable are not covered.
9) Activities, either individually or cumulatively, that may result in degradation to waters of the state are not covered. For example, this general permit shall not be used in incremental means to combine with other projects to alter larger areas of stream.
10) Activities that otherwise require an individual permit are not covered.

Obtaining Permit Coverage:
Coverage under this general permit may be obtained by submitting a signed and completed application (form CN-1091) to the division. Work shall not commence until written authorization from the division is received. As noted above, not all activities can be covered under this general permit, and an application for coverage may be denied when appropriate.

Certain activities do not require the submittal of an application or written authorization from the division prior to commencement of work. Those activities are where the total width of disturbance to the stream channel needed to construct a road crossing is less than 25 feet. Even though written authorization is not required, the proposed activity shall be performed in accordance with all limitations, terms and conditions of this general permit.

Where written authorization is required, the division will establish an expiration date for coverage under this general permit that is specific to the authorization and separate from the general permit's expiration date.

Terms and Conditions of this Permit:

All activities covered under this general permit shall comply with all terms and conditions contained hereinafter.

1) All work shall be accomplished in conformance with the accepted plans, specifications, data and other information submitted in support of the above mentioned application and the limitations, requirements, and conditions set forth herein.
2) All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Rule 1200-4-3-.03 of the Rules of the Tennessee Department of Environment and Conservation. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of waters of the state for any of the uses designated by Rule 1200-4-4. These uses include fish and aquatic life (including trout streams and naturally reproducing trout streams), livestock watering and wildlife, recreation, irrigation, industrial water supply, domestic water supply, and navigation.
3) Applicant is responsible for obtaining the necessary authorization pursuant to applicable provisions of §10 of *The Rivers and Harbors Act of 1899*; §404 of *The Clean Water Act* and §26a of *The Tennessee Valley Authority Act*, as well as any other federal, state or local laws.
4) Applicant is responsible for obtaining coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities for construction sites involving clearing, grading or excavation that result in an area of disturbance of one or more acres, and activities that result in the disturbance of less than one acre if it is part of a larger common plan of development or sale.
5) Where practicable, the bottom of culverts should be constructed below the stream bed level in a manner that allows natural substrate to reestablish.
6) The activity may not be conducted in a manner that would permanently disrupt the movement of fish and aquatic life.
7) Applicant is responsible for complying with all applicable floodplain regulations. It is the responsibility of the applicant to contact local government officials to determine what the regulations are at the specific location of the proposed project.
8) The width of the fill associated with the crossing shall be limited to the minimum necessary for the actual crossing.
9) Only clean rock used for the road crossing may be placed directly in the stream. Clean rock can be of various type and size, depending on the application. Clean rock shall not contain fines, soils or other wastes or contaminants.
10) The crossing shall be culverted, bridged or otherwise designed to prevent the impoundment of normal or base flows. Base flow is the usual or normal flow of the stream that is supplied primarily by groundwater from springs and seeps, but not affected by rapid runoff during and after rainfall.
11) Stream beds shall not be used as transportation routes for construction equipment. Temporary stream crossings shall be limited to one point in the construction area and erosion control measures shall be utilized where stream banks are disturbed. The crossing shall be constructed so that stream flow is not obstructed. Following construction, all materials used for the temporary crossing shall be removed and disturbed stream banks shall be restored and stabilized if needed.
12) Removal of road crossings shall be done in the dry to the maximum extent practicable.
13) Where a crossing is removed, the channel shall be returned to stable conditions, which replicates the characteristics (dimensions, shape, substrate, etc.) of the upstream and downstream conditions.
14) Upon removal of a crossing, stream banks shall be stabilized. Materials used in bank stabilization shall include clean rock, riprap, anchored trees or other non-erodible materials found in the natural environment.
15) Materials used in road crossing projects shall be free of contaminants, including toxic pollutants, hazardous substances, waste metal, construction debris and other wastes as defined by T.C.A. 69-3-103(18).
16) The excavation and fill activities associated with the road crossing shall be kept to a minimum and shall be separated from flowing waters except in instances involving only the placement of a culvert and clean rock. The crossing shall be constructed in the dry to the maximum extent practicable, by diverting flow utilizing cofferdams, berms, temporary channels or pipes. Temporary diversion channels shall be protected by non-erodible material and lined to the expected high water level.
17) Excavated materials, removed vegetation, construction debris, and other wastes shall be removed to an upland location and properly stabilized or disposed of in such a manner as to prevent reentry into the waterway.
18) Material may not be placed in a location or manner so as to impair surface water flow into or out of any wetland area.
19) Sediment shall be prevented from entering waters of the state. Erosion and sediment controls measures shall be designed according to the size and slope of disturbed or drainage areas to detain runoff and trap sediment and shall be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. Information on erosion and sediment control measures can be found in the

department's Erosion and Sediment Control Handbook (www.tn.gov/environment/wpc/sed_ero_controlhandbook/).

20) Erosion and sediment control measures shall be in place and functional before earth moving operations begin, and shall be constructed and maintained throughout the construction period. Temporary measures may be removed at the beginning of the work day, but shall be replaced at the end of the work day.
21) Litter, construction debris, and construction chemicals exposed to storm water shall be picked up prior to anticipated storm events (e.g. forecasted by local weather reports), or otherwise prevented from becoming a pollutant source for storm water discharges (e.g., screening outfalls, daily pick-up, etc.). After use, silt fences should be removed or otherwise prevented from becoming a pollutant source for storm water discharges.
22) Clearing, grubbing and other disturbance to the riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary riparian vegetation removal, including trees, is prohibited.
23) Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than 10 calendar days prior to grading or earth moving unless the area is seeded and/or mulched or other temporary cover is installed.
24) Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the state. All spills shall be reported to the appropriate emergency management agency and to the division. In the event of a spill, measures shall be taken immediately to prevent pollution of waters of the state, including groundwater.
25) This general permit does not authorize impacts to cultural, historical or archaeological features or sites.
26) Failure to comply with the terms and conditions of this permit is a violation of the *Tennessee Water Quality Control Act of 1977* and is subject to penalty in accordance with T.C.A. §69-3-115.

APPROVED: Paul E. Davis DATE: 6/28/10

Paul E. Davis, Director, Water Pollution Control

APPENDIX D

CONSTRUCTION DETAILS

CARYVILLE LIMESTONE ROAD CROSSING CULVERT 100 YEAR-6 HOUR EVENT

Bill Ferrell, PLS, PG

IRTEC
211 Main Street
P.O. Box 306
Caryville, Tennessee 37714

Phone: (423)-566-1915
Email: irtec@comcast.net

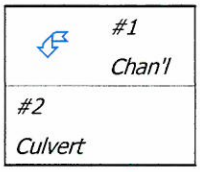
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 6 hr
Rainfall Depth:	4.900 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#2	0.000	0.000	STREAM
Culvert	#2	==>	End	0.000	0.000	CULVERT



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	90.900	90.900	53.68	6.31
#2	0.000	90.900	53.68	6.31

Structure Detail:

Structure #1 (Riprap Channel)

STREAM

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
2.20	4.0:1	4.0:1	13.6	0.30		

Riprap Channel Results:

PADER Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	53.68 cfs	
Depth:	1.04 ft	1.34 ft
Top Width:	10.53 ft	12.93 ft
Velocity:	8.10 fps	
X-Section Area:	6.62 sq ft	
Hydraulic Radius:	0.614 ft	
Froude Number:	1.80	
Manning's n:	0.0490	
Dmin:	3.00 in	
D50:	6.00 in	
Dmax:	9.00 in	

Structure #2 (Culvert)

CULVERT

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
200.00	4.00	0.0240	9.00	0.00	0.90

Culvert Results:

Design Discharge = 53.68 cfs

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Minimum pipe diameter: 1 - 36 inch pipe(s) required

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	90.900	0.345	0.000	0.000	60.000	S	53.68	6.308
	Σ	**90.900**						**53.68**	**6.308**
#2	Σ	**90.900**						**53.68**	**6.308**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	1. Forest with heavy ground litter	20.00	200.00	1,000.00	1.130	0.245
		6. Grassed waterway	13.60	272.00	1,999.99	5.530	0.100
#1	**1**	**Time of Concentration:**					**0.345**